

time a data unit is buffered in one of the P stores within data buffer 550 which corresponds to output port 540, output control 580 increments a backlog value in a memory corresponding to the store so that the current backlog of data units stored in each of the P stores is determinable by output control 580 by reference to the incremented values. More generally, each time a data unit is buffered in one of the I x P stores within one of the data buffers, output control 580 increments a backlog value in the corresponding memory. Input control 560 obtains buffering information through the transmission of "Requests". Thus, in the case of a flow from input port 510 to output port 540, input control 560 monitors data buffer 550 and for each buffered data unit destined for output port 540 transmits on line 515 a "Request" to release the data unit, which specifies the source input port and priority of the data unit. Output control 580 increments a value in the memory which corresponds to the specified source input port and priority.

In the Claims:

Please cancel claims 6 and 17. Please amend claims 1, 7, 10, 11, 12, 18 and 23, as follows:

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~~1. (Amended) An ATM switch, comprising:~~  
~~a plurality of input ports for receiving data units on virtual connections;~~  
~~a plurality of output ports, each output port operatively associated with a plurality of output data stores and an output control; and~~  
~~a switch fabric for switching data units from any of the input ports to any of the output ports;~~  
~~wherein the output data stores are arranged to buffer data units for delivery to their associated output ports, and the output controls are arranged to monitor the backlog of buffered data units for~~

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~~delivery to their associated output ports and, if the backlog reaches a particular level, to enforce a rate limitation against additional data units for delivery to their associated output ports, wherein the additional data units in violation of the rate limitation are filtered.~~

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2. The ATM switch according to claim 1, wherein each of the data units designates a priority and the additional data units which designate relatively high priorities are not in violation of the rate limitation.

3. The ATM switch according to claim 1, wherein each of the data units designates a priority and the additional data units which designate relatively low priorities are in violation of the rate limitation.

4. The ATM switch according to claim 1, wherein each of the data units designates a priority and the determination of whether the additional data units which designate relatively low priorities are in violation of the rate limitation is based on a "leaky bucket" algorithm.

5. The ATM switch according to claim 1, wherein if the backlog falls below a particular level, the output controls are arranged to lift the rate limitation.

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7. (Amended) The ATM switch according to claim 1, wherein the data stores are physically associated with output ports.

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8. The ATM switch according to claim 1, wherein the rate limitation is enforced at inputs.

9. The ATM switch according to claim 1, wherein the rate limitation is enforced at outputs.

~~10. (Amended) An ATM switch, comprising:~~

a plurality of input ports for receiving data units on virtual connections;

a plurality of output ports, each output port operatively associated with a plurality of output data stores and an output control; and

a switch fabric for switching data units from any of the input ports to any of the output ports;

wherein the output data stores are arranged to buffer data units for delivery to their associated output ports, and the output controls are arranged to monitor the backlog of buffered data units for delivery to their associated output ports and, if the backlog buffered in one or more selected stores reaches a particular level, to enforce a rate limitation against additional data units for delivery to their associated output ports, wherein the additional data units in violation of the rate limitation are filtered.

11. (Amended) The ATM switch according to claim 10, wherein each output data store buffers data units having a distinct priority.

12. (Amended) The ATM switch according to claim 10, wherein each output data store buffers data units having a distinct priority and input port combination.

13. The ATM switch according to claim 10, wherein each of the data units designates a priority and the additional data units which designate relatively high priorities are not in violation of the rate limitation.

14. The ATM switch according to claim 10, wherein each of the additional data units designates a priority and the additional data units which designate relatively low priorities are in violation of the rate limitation.

15. The ATM switch according to claim 10, wherein each of the data units designates a priority and the determination of whether the additional data units which designate relatively low priorities are in violation of the rate limitation is based on a "leaky bucket" algorithm.

16. The ATM switch according to claim 10, wherein if the backlog falls below a particular level, the output controls are arranged to lift the rate limitation.

25 18. (Amended) The ATM switch according to claim 10, wherein the data stores are physically associated with output ports.

19. The ATM switch according to claim 10, wherein the rate limitation is enforced at inputs.

20. The ATM switch according to claim 10, wherein the rate limitation is enforced at outputs.

21. The ATM switch according to claim 10, wherein each of the data units designates a priority and an input port and the determination of whether the additional data units which designate relatively low priorities and a particular input port are in violation of the rate limitation is based on a "leaky bucket" algorithm.

22. The ATM switch according to claim 21, wherein the particular input port is associated with a selected store whose backlog caused the selective filtering condition to be imposed.

23. (Amended) A DIBOC-based ATM switch, comprising:

*Sub 1*  
a plurality of input ports for receiving data units on virtual connections, each input port physically associated with a plurality of data stores and an input control for transmitting "Requests" to release data units;

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a plurality of output ports, each output port operatively associated with the plurality of the data stores and physically associated with an output control for monitoring "Requests" to release data units; and

a switch fabric for switching data units for any of the input ports to any of the output ports,

wherein the data stores are arranged to buffer data units for delivery to their associated output ports, and the output controls are arranged to monitor the backlog of buffered data units for delivery to their associated output ports, through information transmitted in "Requests" and, if the backlog reaches a particular level, to enforce a rate limitation against additional data units for delivery to their associated output ports, wherein the additional data units in violation of the rate limitation are filtered.

24. The ATM switch according to claim 23, wherein each data store buffers data units having a distinct priority.

25. The ATM switch according to claim 23, wherein each of the data units designates a priority and the additional data units which designate relatively high priorities are not in violation of the rate limitation.

26. The ATM switch according to claim 23, wherein each of the data units designates a priority and the additional data units which designate relatively low priorities are in violation of the rate limitation.

27. The ATM switch according to claim 23, wherein each of the data units designates a priority and the determination of whether the additional data units which designate relatively low priorities are in violation of the rate limitation is based on a "leaky bucket" algorithm.

28. The ATM switch according to claim 23, wherein if the backlog falls below the particular level, the output controls are arranged to lift the rate limitation.

29. The ATM switch according to claim 23, wherein the output controls impose the rate limitation by transmitting congestion control signals to the input controls.

30. The ATM switch according to claim 28, wherein the output controls lift the rate limitation by transmitting congestion control signals to the input controls.

31. The ATM switch according to claim 23, wherein each of the data units designates a priority and an input port and the determination of whether the additional data units which designate relatively low priorities and a particular input port are in violation of the rate limitation is based on a "leaky bucket" algorithm.

32. The ATM switch according to claim 31, wherein the particular input port is associated with a selected store whose backlog caused the rate limitation to be imposed.

33. An ATM switch, comprising:  
a plurality of input ports for receiving data units on virtual connections;  
a plurality of output ports, each output port operatively associated with a plurality of data stores and an output control; and  
a switch fabric for switching data units from any of the input ports to any of the output ports;  
wherein the data stores are arranged to buffer data units for delivery to their associated output ports, and the output controls are arranged to monitor the backlog of buffered data units in two or more of said plurality of data stores for delivery to their associated output ports and, if the backlog reaches a particular level, to enforce a rate limitation against additional data units for delivery to their associated output ports, wherein the additional data units in violation of the rate limitation are filtered.

34. The ATM switch according to claim 33, wherein each of the data units designates a priority and the additional data units which designate relatively high priorities are not in violation of the rate limitation.

35. The ATM switch according to claim 33, wherein each of the data units designates a priority and the additional data units which designate relatively low priorities are in violation of the rate limitation.

36. The ATM switch according to claim 33, wherein each of the data units designates a priority and the determination of whether the additional data units which designate relatively low priorities are in violation of the rate limitation is based on a "leaky bucket" algorithm.

37. The ATM switch according to claim 33, wherein if the backlog falls below a particular level, the output controls are arranged to lift the rate limitation.

38. The ATM switch according to claim 33, wherein the data buffers are physically associated with input ports.

39. The ATM switch according to claim 33, wherein the data buffers are physically associated with output ports.

40. The ATM switch according to claim 33, wherein the rate limitation is enforced at inputs.

41. The ATM switch according to claim 33, wherein the rate limitation is enforced at outputs.

42. An ATM switch, comprising:  
a plurality of input ports for receiving data units on virtual connections;  
a plurality of output ports, each output port operatively associated with a plurality of data stores and an output control; and  
a switch fabric for switching data units from any of the input ports to any of the output ports;

wherein the data stores are arranged to buffer data units for delivery to their associated output ports, and the output controls are arranged to monitor the backlog of buffered data units in two or more of said plurality of data stores for delivery to their associated output ports and, if the backlog buffered in one or more selected stores reaches a particular level, to enforce a rate limitation against additional data units for delivery to their associated output ports, wherein the additional data units in violation of the rate limitation are filtered.



43. The ATM switch according to claim 42, wherein each data store buffers data units having a distinct priority.

44. The ATM switch according to claim 42, wherein each data store buffers data units having a distinct priority and input port combination.

45. The ATM switch according to claim 42, wherein each of the data units designates a priority and the additional data units which designate relatively high priorities are not in violation of the rate limitation.

46. The ATM switch according to claim 42, wherein each of the additional data units designates a priority and the additional data units which designate relatively low priorities are in violation of the rate limitation.

47. The ATM switch according to claim 42, wherein each of the data units designates a priority and the determination of whether the additional data units which designate relatively low priorities are in violation of the rate limitation is based on a "leaky bucket" algorithm.

48. The ATM switch according to claim 42, wherein if the backlog falls below a particular level, the output controls are arranged to lift the rate limitation.

49. The ATM switch according to claim 42, wherein the data buffers are physically associated with input ports.

50. The ATM switch according to claim 42, wherein the data buffers are physically associated with output ports.